

first and second buried layers provided within the semiconductor substrate, being of the first conductivity type, and being of a higher concentration than the semiconductor substrate;

first and second emitter layers of the first conductivity type;

first and second base layers of the second conductivity type;

and a substrate layer constituted by the semiconductor substrate,

wherein the substrate layer is sandwiched between the first and second buried layers,

wherein the first and second base layers are positioned on one side surface and the other side surface of the semiconductor substrate so as to form PN planar junctions with the first and second buried layers along the first and second base layers and the first and second buried layers,

wherein the first and second emitter layers are located in a vicinity of a surface of inside of the first and second base layers so as to form PN junctions with the first and second base layers

wherein at least a part of the first and second base layers are respectively provided between the first and second emitter layers and the first and second buried layers, and

wherein at least a part of the first and second buried layers are located between the first and second base layers and the substrate layer.

2. (Amended) The semiconductor device of claim 1, wherein first metal film is formed on the one side of the semiconductor substrate, and second metal film is formed on the other side of the semiconductor substrate, and the first emitter layer and the first base layer being electrically short-circuited by the first metal film, and the second emitter layer and the second base layer being electrically short-circuited by the second metal film.

Claims 12 - 15 have been added as follows:

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12. A semiconductor device having, when one of either an N-type or P-type is defined as a first conductivity type, and the other is defined as a second conductivity type, a semiconductor substrate of the first conductivity type, the semiconductor device comprising:

first and second buried layers provided within the semiconductor substrate, being of the first conductivity type, and being of a higher concentration than the semiconductor substrate;

first and second emitter layers of the first conductivity type;

first and second base layers of the second conductivity type;

a substrate layer constituted by the semiconductor substrate,

ring-shaped first moat is provided on the surface of the first base layer,

and ring-shaped second moat is provided on the surface of the second base layer,

wherein the substrate layer is sandwiched between the first and second buried layers,

wherein the first and second base layers are positioned on one side surface and the other side surface of the semiconductor substrate so as to form PN junctions with the first and second buried layers,

wherein the first and second emitter layers are located in a vicinity of a surface of inside of the first and second base layers so as to form PN junctions with the first and second base layers,

wherein at least a part of the first and second base layers are respectively provided between the first and second emitter layers and the first and second buried layers, and

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wherein at least a part of the first and second buried layers are located between the first and second base layers and the substrate layer,

wherein the first moat having bottom surfaces reaching the first buried layer, and both outer periphery and inner periphery of the first moat are in contact with the first base layer,

wherein the second moat having bottom surfaces reaching the second buried layer, and both outer periphery and inner periphery of the second moat are in contact with the second base layer.

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13. The semiconductor device of claim 12, wherein first metal film is formed on the one side of the semiconductor substrate, and second metal films is formed on the other side of the semiconductor substrate respectively, the first emitter layer and the first base layer being electrically short-circuited by the first metal film, and the second emitter layer and the second base layer being electrically short-circuited by the second metal film.

14. The semiconductor device of claim 12, wherein the first emitter layer is located in a region surrounded by the first moat, and the second emitter layer is located in a region surrounded by the second moat.

15. The semiconductor device of claim 12, wherein the insides of the first and second moats are filled with oxide.
